

REMARKS

Prior to entry of the present Amendment, claims 1-9 were pending the present application. Claim 5 is canceled above. Claims 1, 6 and 7 are amended above. No new matter is added by the claim amendments. Entry is respectfully requested.

Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, for containing subject matter that was not described in the specification as filed. Specifically, the Office Action at page 2, first paragraph states that there is no support in the specification for an insulating plug having an upper surface that is at a same level as an upper surface of the first line unit and an upper surface of the second line unit, as claimed in independent claim 1. Section 2163 of the Manual of Patent Examining Procedure (M.P.E.P.) states that “to satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the invention had possession of the claimed invention.” Section 2163 of the M.P.E.P. further states that possession may be shown by a “clear depiction of the invention in detailed drawings...which permit a person skilled in the art to clearly recognize that applicant had possession of the claimed invention.” Accordingly, Applicants respectfully renew their request that the Examiner refer to FIG. 4 and page 6, lines 2-7 of the present specification, which clearly teaches an insulating plug 127 having an upper surface that is at a same level as an upper surface of a first line unit 120a and an upper surface of a second line unit 120b.

In remarks made in the Office Action at page 2, first paragraph, it is further stated that the first line unit must be a conductive element. Applicants respectfully submit that the Office Action fails to explain the relationship between the first line unit being a conductive element and the rejection based on the written description requirement. If the Office Action is attempting to assert that there is no support in the specification for a “first line unit, which substantially functions as an electrode line...,” as claimed in independent claim 1, then Applicants respectfully disagree, and refer the Examiner to the specification at page 5, line 29 through page 6, line 2. If the Office Action is asserting that the claimed insulating plug does not have an upper surface that

is at an upper surface of the first line unit and upper surface of the second line unit because the upper surface of the conductor layer element (see, for example, FIG. 4, element 105) is not at the same level as the insulating plug (see, for example, FIG. 4, element 127), then Applicants also respectfully disagree with this assertion, since the claimed electrode lines comprise a hard mask layer. Applicants make reference to the specification at page 6, lines 6-7, which discloses electrode lines 130 each including a conductive layer 105 and a hard mask layer 110, and FIG. 4 and page 6, lines 15-23, which discloses that the first line unit 120A likewise comprises a conductive layer 105 and a hard mask layer 110.

Along these lines, Applicants note that claim 1 is amended herein to clarify that an “insulating plug” has an “upper surface” that is “at a same level” as an “upper surface” of a “hard mask layer portion” of a “first line unit.” No new matter is added by this claim amendment.

For these reasons, it is believed that the specification and drawings of the present application as filed describes the invention, as claimed, to one of skill in the art. Accordingly, reconsideration and removal of the rejection of claims 1-9 under 35 U.S.C. 112, first paragraph, are respectfully requested.

Claims 1-9 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Ejiri (U.S. Patent No. 6,770,974) in view of Applicant Admitted Prior Art (AAPA). Reconsideration and removal of the rejections are respectfully requested.

In the present invention as claimed in amended independent claim 1, an electrode line structure of a semiconductor device comprises “electrode lines” on a “semiconductor substrate.” Each “electrode line” comprises a “conductive layer” and a “hard mask layer.” The “electrode lines” each include a “first line unit, which substantially functions as an electrode line,” and a “second line unit.” The “second line unit” is “separated from the first line unit” by a “hole” that is formed through the “conductive layer and the hard mask layer of each electrode line.” The “hole” has a “width between a hard mask layer portion of the first line unit and a hard mask layer

portion of the second line unit” that is substantially the same width as a “width between a conductive layer portion of the first line unit and a conductive layer portion of the second line unit.” Each “electrode line” further includes an “insulating plug” which is “positioned in the hole between the first line unit and the second line unit.” The “insulating plug” has an “upper surface” that is at a same level as “the upper surface of the hard mask portion of the first line unit and the upper surface of the hard mask portion of the second line unit.” The “insulating plug” has a “width between the hard mask layer portion of the first line unit and the hard mask layer portion of the second line unit” that is the same width as “the width between the conductive layer portion of the first line unit and the conductive layer portion of the second line unit.”

It is submitted that the combination of Ejiri and AAPA fails to teach or suggest a “hole” that is formed through a “conductive layer” and a “hard mask layer” of each “electrode line,” such that the “hole has a width between a hard mask layer portion of” a “first line unit” and a “second line unit” that is “substantially the same as a width between a conductive layer portion of the first line unit and a conductive layer portion of the second line unit,” as claimed in amended independent claim 1. Ejiri discloses a lower electrode 18b and a dummy electrode 18c that are separated by a recess (see Ejiri, FIGs. 13 and 16). Ejiri further discloses an insulating film 24 that fills the recess, and covers portions of the lower electrode 18b and a dummy electrode 18c (see Ejiri, FIGs. 13 and 17). However, there is no teaching or suggestion in Ejiri of a “hole” that is formed through a “conductive layer” and a “hard mask layer,” as claimed in amended independent claim 1. Nor is there any teaching or suggestion in Ejiri of a “hole” having a “width between a hard mask layer portion of” a “first line unit” and a “second line unit” that is “substantially the same as a width between a conductive layer portion of the first line unit and conductive layer portion of the second line unit,” as claimed in amended independent claim 1. Specifically, there is no mention in Ejiri of a “hole” that is formed through the insulating film 24 and the electrodes 18b, 18c of Ejiri. Moreover, if the lower electrode 18b of Ejiri is a “first line unit,” as stated in the Office Action at page 3, lines 9-10, and if the dummy electrode 18c of Ejiri is a “second line unit,” as stated in the Office Action at page 3, lines 10-11, then the recess between lower electrode 18b and dummy electrode 18c is not the Applicants’ claimed hole, since

the recess in Ejiri is not “formed through” a “hard mask layer,” as claimed. On the other hand, if the insulating film 24 and lower electrode 18b of Ejiri comprise a “first line unit,” and the insulating film 24 and dummy electrode 18c of Ejiri comprise a “second line unit,” then Ejiri also fails to teach a “hole,” as claimed, since the recess disclosed in Ejiri does not extend through the insulating film 24 that is formed over the recess. It therefore follows that, since the recess of Ejiri does not extend through the insulating film 24 of Ejiri, the recess does not have a “width between a hard mask layer portion of” a “first line unit” and a “second line unit” that is “substantially the same as a width between a conductive layer portion of the first line unit and a conductive layer portion of the second line unit,” as claimed in amended independent claim 1.

With regard to AAPA, there is no teaching or suggestion in AAPA of a “hole” that is formed through a “conductive layer” and a “hard mask layer” of each “electrode line,” such that the “hole” has a “width between a hard mask layer portion of” a “first line unit” and a “second line unit” that is “substantially the same as a width between a conductive layer portion of the first line unit and a conductive layer portion of the second line unit,” as claimed in amended independent claim 1.

In addition, it is submitted that the combination of Ejiri and AAPA fails to teach or suggest an “insulating plug which is positioned in the hole between the first line unit and the second line unit” that has an “upper surface that is at a same level as the upper surface of the hard mask layer portion of the first line unit and the upper surface of the second line unit,” wherein the “insulating plug” has a “width between the hard mask layer portion of the first line unit and the hard mask layer portion of the second line unit” that is substantially the same as a “width between the conductive layer portion of the first line unit and the conductive layer portion of the second line unit,” as claimed in amended independent claim 1. For reasons stated above, neither Ejiri nor AAPA teaches or suggests a “hole,” as claimed. Specifically, there is no teaching or suggestion in Ejiri the portion of the insulating film 24 filling the recess being positioned in a “hole” between a “first line unit” and a “second line unit,” as claimed.

Moreover, there is no teaching or suggestion of the portion of the insulating film 24 filling the recess of Ejiri being an “insulating plug” that has a “width between the hard mask layer portion of the first line unit and the hard mask layer portion of the second line unit” that is substantially the same as a “width between the conductive layer portion of the first line unit and the conductive layer portion of the second line unit,” as claimed in amended independent claim 1. Accordingly, Applicants agree with statements made in the Office Action at page 7, lines 5-6, namely, that the portion of the insulating material 24 formed over the upper surface of the first line unit (lower electrode 18b) and an upper surface of the second line unit (dummy electrode 18c) cannot be a “plug.”

With regard to statements made in the Office Action at page 7, first paragraph, it is apparently asserted that the insulating film 24 is an insulating plug that has an upper surface that is the same as first line unit 18b and second line unit 18c of Ejiri. However, for reasons described above, the insulating film 24 is not Applicants’ claimed “insulating plug.”

Further, with regard to statements made in the Office Action at page 7, second paragraph, it is apparently asserted that the insulating film 24 and lower electrode 18b comprise a first line unit, and that insulating film 24 and dummy electrode 18c comprise a second line unit, and that insulating film 24 is also an insulating plug. However, this asserted configuration of Ejiri is also different than the claimed invention, for reasons described above.


It is therefore submitted that Ejiri and AAPA, taken alone or in combination, fail to teach or suggest the invention set forth in the amended claims. Since the combination of Ejiri and AAPA fails to teach or suggest the invention set forth in claim 1, amended independent claim 1 is believed to be allowable over the cited references. Reconsideration and removal of the rejections of claims 1-9 under 35 U.S.C. 103(a) based on the combination of Ejiri and AAPA, and allowance of claims 1-9 are respectfully requested.

Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

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